REMARKS

This amendment is filed in response to the Final Office Action mailed December 28, 2004. Filed herewith is a Request for Continued Examination.

The Examiner rejects Claims 55 and 57-59 under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over *Corbett et al.* (5,895,699).

Applicants amend Claim 55 and add new Claims 88 and 89 that overcome the Examiner's rejections placing the application in order for prompt allowance.

Rejection Under 35 U.S.C. § 102(e)

The Examiner rejects Claims 55 and 57-59 under 35 U.S.C. § 102(e) as anticipated by *Corbett et al.* Applicant amends Claim 55 and introduces new Claims 88 and 89 to further clarify the distinction between the teachings disclosed in *Corbett et al.* and the present invention.

The present invention introduces a stiffness-treated prepreg ply to a honeycomb core sandwich structure precursor that is not in contact with the honeycomb core, but is in contact with a second prepreg ply, which second prepreg ply is in contact with the honeycomb core. The second prepreg ply can be either stiffness-treated or untreated. Applicants' amendment to Claim 55 and new Claims 88 and 89 claim that the stiffness-treated prepreg ply of the present invention is not in direct contacting relation to the honeycomb core, but still surprisingly resists slippage of the precursor to reduce the incidence of core crush.

The critical element of the *Corbett et al.* invention is the location of an additional tiedown layer in contact with the honeycomb core. *Corbett et al.* discloses two tiedown forms; the normal tiedown and the *Corbett et al.* tiedown. The "normal tiedown procedure entails plies on the outer surfaces of the skins and internally between the skin and underlying adhesive." *Corbett et al.* column 6, lines 41-45. *Corbett et al.* goes on to assert that the normal tiedown procedure system "fails without the "picture frame" ply [the *Corbett et al.* invention] because the barrier film 110 permits the core to slip." *Corbett et al.* column 6, lines 41-45. Figure 6 of *Corbett et al.* illustrates the normal tiedowns 175 and the *Corbett et al.* tiedowns 150;

the *Corbett et al.* tiedowns lying between the barrier layer and the honeycomb core, in direct contact with the core.

Corbett et al. also states that core crush "occurs in the chamfer region 155 when the barrier film 110 and core 106 slip relative to the facesheets 102 when autoclave pressure is applied and when the resin is melted." *Corbett e al.* at Col. 5, ln 41-44. *Corbett et al.* goes on to state that, "...we reduce core crush during autoclave curing by incorporating at least one tiedown ply between the core 106 and skin 102 to reduce damaging slippage between the core and skin that otherwise often occurs." *Corbett et al.* at Col. 3, ln 63-67. *Corbett et al.* further restricts their invention stating that their, "improved honeycomb sandwich panel includes at least one tiedown ply 150 in contact with the core 106 along a chamfer 155." *Corbett et al.* at Col.5, ln 49-51.

Accordingly, *Corbett et al.* clearly teaches that honeycomb core prepreg systems fail, exhibit a greater propensity for core crush, when the tiedown layer is not in direct contact with the honeycomb. In other words, *Corbett et al.* asserts that a remedy to core crush can only be found by means of restricting slippage at the honeycomb core interface.

A severe defect exists in the use of the *Corbett et al.* tiedown, however. As *Corbett et al.* states, "The key factor is that the tiedown ply 150 contact the core beneath the adhesive and barrier film 110 which is used to bond the laminate skin to thecore." *Corbett et al.* Col. 6, lines 10-13. This configuration creates a defect where the *Corbett et al.* tiedown exists, because it does not allow the adhesive and barrier film to contact the core, thus adhesion of the skin to the core in the chamfer region is necessarily degraded because the tiedown does not act as an adhesive in that area. As such, a means of reducing the risk of core crush without interfering with the adhesive/core interface is needed and Applicants' invention fulfills this need.

Corbett et al. does not teach a means for reducing the risk of core crush involving prepreg layers not in contact with the honeycomb core and does not teach a method of increasing the friction between such prepreg layers. Indeed, *Corbett et al.* teaches that technology associated with layers not in contact with the honeycomb core, "fails without the "picture frame" ply because the barrier film 110 permits the core to slip." *Corbett et al.* column 6, lines 44-45.

Applicants' invention surprisingly finds a way of reducing the risk of core crush away from the honeycomb core interface by increasing the friction between prepreg layers; not necessarily between the honeycomb core and a contacting layer. Applicants' invention "allows for greater frictional resistance between a stiffness-treated prepreg ply and any other ply (stiffness-treated or untreated) than the frictional resistance between two untreated prepreg plies." Applicants' page 9, lines 1 – 4. Applicants' Claim 55 defines the invention as a "stiffness-treated prepreg ply, when disposed on the second prepreg ply ...exhibiting a frictional resistance between the stiffness-treated prepreg ply and the second prepreg ply sufficiently greater than the frictional resistance between two untreated prepreg plies disposed on one another..." Claim 88 defines the invention as a "stiffness-treated prepreg ply [that] exhibits a frictional resistance to the second prepreg ply.." and further claims that a second prepreg ply that is either stiffness-treated or untreated is "interposed between the honeycomb core and the stiffness-treated prepreg ply." Similarly, Claim 89 claims a "plurality of prepreg plies, wherein at least one of the prepreg plies is a stiffness-treated prepreg ply not in contact with the honeycomb core."

As such, Applicants' invention as claimed is not anticipated, disclosed or taught, by *Corbett et al.* Therefore, Applicants respectfully request that the Examiner's rejection be withdrawn and the claims allowed.

Rejection Under 35 U.S.C. § 103(a)

The Examiner rejects Claims 55 and 57-59 under 35 U.S.C. § 103(a) as obvious over *Corbett et al.* (5,895,699). The Examiner asserts that since "similar materials (i.e. prepregs made from fabrics including a polymeric material disposed on at least some of the fibers) [are] used to produce a prepreg layer" the stiffness, and thus friction limitations, are an inherent property of *Corbett et al.*

First, the Examiner asserts that while the stiffness value claimed by Applicants is not taught by *Corbett et al.*, it is reasonable to presume that said limitations are inherent to the invention. The Examiner asserts that similar materials are utilized, including fabrics with polymeric material disposed on at least some of the fibers, and thus, the stiffness value is an inherent property.

The stiffness value may be inherent between similar materials as noted by the Examiner, but in the present case, the polymeric materials disclosed as a matrix

resin in *Corbett et al.* are vastly different than the polymerized polymeric stiffening material precursors claimed in Applicants' amended Claim 55 and new Claims 88 and 89. Applicants define an untreated fabric, which would be equivalent to that known in the art as disclosed by *Corbett et al.*, as containing "precursors of polymeric stiffening material, wherein both the fabric and the fabric raw materials have not been treated under conditions which advance polymerization and/or derivative formation of precursors of polymeric materials to the extent necessary to reduce core crush..." Applicants page 20, lines 17-20.

Accordingly, to further clarify Applicants' invention in Claim 55 as well as new Claims 88 and 89, Applicants claim that the polymeric material is a "polymerized" polymeric material. Support for this amendment may be found for example at Applicants page 14, lines 22-24 as well as numerous other locations. As such, Applicants clarify that the polymeric material on the fibers is a polymeric material precursor specially conditioned to advance polymerization in order to attain the enhanced stiffening properties claimed. Not a resin system.

Applicants claim polymerized polymeric stiffening materials defined as "derivatives of the precursors of a polymeric material." Applicants page 14, lines 22 - 24. Applicants disclose the treatment conditions to obtain the polymerized polymeric stiffening material as "those that advance polymerization of the precursors of the polymeric material with each other, and include temperature, pressure and other reaction conditions." Applicants page 15, lines 9-13. "Preferably, the derivatives are polymerized from the precursors prior to wetting the fabric on which the precursors may be disposed with an appropriate resin." Applicants Page 16, lines 15-18. The "precursors of a polymeric material useful in the practice of the invention include chemical agents associated with a particular fiber, which chemical agents are utilized by those of skill in the art to facilitate weaving of the fibers into a fabric, and/or to enhance the processability and/or mechanical properties of the fibers..." Applicants page 16, lines 20-26.

Therefore, Applicants claim the use of a polymerized derivative of polymeric material precursors, whereas *Corbett et al.* discloses known polymeric materials. As such, the *Corbett et al.* materials are not similar to those claimed by Applicants.

Furthermore, the properties of Applicants' claimed polymerized polymeric stiffening materials are not inherent to the properties of the polymeric resin materials

disclosed or formed by the processes disclosed in *Corbett et al.* because the materials are not similar.

In order to satisfy the judicially created doctrine of inherency the element of a claim that is not expressly disclosed in a prior art reference is inherently disclosed therein if, and only if, the "missing" element is necessarily present. *Hansgirg v. Kemmer*, 102 F.2d 212, 40 USPQ 665 (CCPA 1939). The "mere fact that a certain thing *may* result from a given set of circumstances is not sufficient." *Hansgirg*, 40 USPQ at 667 (emphasis in original). Similarly stated, the reference "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Continental Can v. Monsanto*, 948 F.2d 1264, 20 USPQ 2d 1746 (Fed.Cir. 1991).

Applicants claimed polymerized derivatives of polymeric material precursors are not similar to those disclosed in *Corbett et al.* In order to obtain a stiffened material, the polymeric material precursors must undergo conditions for the advancement of polymerization to an extent necessary to reduce core crush and Applicants identify the preferred conditions for the advancement of polymerization. See Applicants page 20, line 13 to page 21, line 14.

Corbett et al. discloses the use of a polymeric material on the structural fibers, as the Examiner notes, as a resin matrix for the prepreg. *Corbett et al.* does not disclose use of a polymerized polymeric material precursor as disclosed and claimed by Applicants. As such, while the initial polymeric material precursors may be similar, the characteristics of the polymerized polymeric material claimed by Applicants and the polymeric material disclosed by *Corbett et al.* are not similar. Polymerize polymeric material precursors are not disclosed by *Corbett et al.*

While use of a polymeric material disclosed in *Corbett et al.* might result in its acting a polymerized polymeric stiffening material, although not likely, it is certainly not necessary or absolute. The polymeric material in *Corbett et al.* is the resin matrix applied to the fibers to form the prepreg, and might polymerize or degrade as described by Applicants, but not necessarily. Indeed, higher temperatures or chemical processing are generally necessary to polymerize the polymeric material, prior to adding any resin to the fibers. Applicants page 20, line 13 to page 21, line 14. As such, the stiffened property which provides increased friction cannot be perceived as inherent to the *Corbett et al.* materials.

Therefore, the Examiner's rejection is overcome by Applicants' amendments and new claims which further clarify that the invention uses a polymerized polymeric stiffening material for which the characteristics are not inherent in the process disclosed by *Corbett et al.*

Second, the Examiner asserts that the claimed frictional resistance of Applicants' invention would obviously have been provided by the process disclosed by *Corbett et al.* However, the increased frictional resistance taught by the process disclosed in *Corbett et al.* is between the tiedown layer in contact with the honeycomb core. The present invention does not resist core crush by increasing the frictional resistance between the honeycomb core and a prepreg layer, but rather by increasing the frictional resistance between prepreg layers themselves; a concept that *Corbett et al.* clearly teaches is futile by referencing the older "normal tiedown" method. As such, the increased frictional resistance between prepreg layers as claimed by Applicants is not provided by the process disclosed in *Corbett et al.* and is in fact taught away from by *Corbett et al.*

Accordingly, Applicants respectfully request that the Examiner's rejections be withdrawn and that Claims 55, 57-59, 88 and 89 are in position for allowance.

It is submitted that the prepreg of a honeycomb sandwich structure precursor as claimed defines a patentable invention. Reconsideration of the application is respectfully requested and prompt allowance is sought. Please direct any questions to the undersigned attorney at (714) 666-4396.

The Commissioner is hereby authorized to charge any additional fees associated with this paper or during the pendency of this application, or credit any overpayment, to Deposit Account No. 03-4083.

Respectfully submitted,

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